AMENDMENT NO. 1 JANUARY 2020

TO

IS 11329 : 2018 FINNED TYPE HEAT EXCHANGER FOR ROOM AIR CONDITIONER

(First Revision)

(*Page* 1, *clause* **1**) — Substitute the following for the existing clause:

‘**1 SCOPE**

This standard specifies the general requirement and method of tests for finned type heat exchangers used for the manufacturing of room air conditioners up to and including capacity of 10 500 W.’

(*Page* 1, *clause* **3.4**) — Substitute the following for the existing clause:

‘**3.4 Design Pressure** — Pressure chosen for the strength calculation of each component.

NOTES

1 It is used for determining the necessary materials, thickness, and construction for components with regard to their ability to withstand pressure.

2 Considering the wide range of temperature profile in India it is recommended that while designing the air conditioners, ambient temperature prevailing in different parts of the country may be considered.’

(*Page* 1, *clause* **3.7**) — Delete.

(*Page* 2, *Fig.* 1) — Insert the following note under figure:

‘NOTE — Fig. 1A and Fig. 1B is for reference only.’

(*Page* 2, *clause* **3.16**) — Delete.

(*Page* 2, *clause* **3.17**) — Substitute the following for the existing clause:

‘**3.17 Fin Pattern** — It is an arrangement of tube pitch in plate fin with collar and tube arrangement.’

Price Group 2

(*Page* 2, *Fig*. 2) — Delete.

(*Page* 2, *clause* **4.1.1**) — Substitute '*Fin Pack with Collar and Tube Type (FTHX)' for* '*Fin Pack with Collar and Tube Type'.*

(*Page* 2, *clause* **4.1.1.2**) — Substitute the following for the existing clause:

'**4.1.1.2** *Copper inner groove / micro groove tube and aluminium fin (IGAF)*

These tubes of heat exchangers are made of inner grooved copper tube (IGT) or micro grooved copper tube and aluminium plate fins with collar packs.'

(*Page* 2, *Fig*. 3) — Insert the following note at the end of figure:

'NOTE — Figure 3 is for reference only.'

(*Page* 3, *clause* **4.1.1.4**) — Substitute '*Enhanced fin surfaces* (*EFST*)' *for* '*Enhanced fin surfaces'.*

(*Page* 3, *clause* **4.1.2**) — Substitute '*Micro Channel Aluminium Tube and Aluminium Fin Heat Exchanger* (*MCHX*)' *for* '*Micro Channel Aluminium Tube and Aluminium Fin Heat Exchanger* (*MCHE*)' in the title.

(*Page* 3, *Fig*. 4) — Substitute the following for the existing figure:

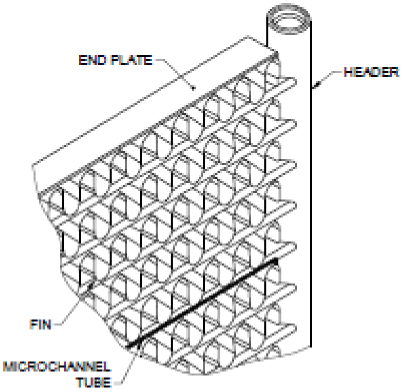

Fig. 4 Microchannel Heat Exchanger (Cut Section)

(*Page* 3, *clause* **5.1**) — Substitute the following for the existing clause:

‘5.1 Tube Material

The material for the tube shall be of copper or aluminium and shall conform to the relevant standards as described below:

a) *Copper tube* — Copper tube shall conform to IS 10773 or International standard for copper tube used in air conditioner.

b) *Aluminium tube* — Aluminium tube material shall conform to IS 737or International Standard for aluminium tube used in air conditioner.

c) *Aluminium microchannel tube* — Aluminium tube material shall conform to IS 737 or International standard for aluminium tube used in air conditioner.

NOTE — Suitable material other than Al/ Cu may be used as per manufacturers design.’

[*Page* 4, *clause* **5.2** a)] — Substitute the following for the existing clause:

a) *Aluminium fin* — Aluminium fin material shall conform to IS 737 or International Standard.

[*Page* 4, *clause* **5.2** b)] — Delete.

[*Page* 4, *clause* **5.3** a)] — Substitute the following for the existing:

‘b) *Zinc coated galvanized iron (GI) sheet* — Tube sheet/end plate material shall conform to IS 277.’

[*Page* 4, *clause* **5.3** b)] — Substitute the following for the existing:

‘b) *Aluminium sheet* — Aluminium tube material shall conform to IS 737 or International Standard.’

(*Page* 4, *clause* **6.1**) — Substitute the following for the existing clause:

‘6.1 Workmanship

The visual inspection to be carried out for any abnormal scratches, dents as defined in quality management system.

The ends will be covered with caps, plugs or polythene wrapping to prevent any contamination entering in heat exchangers, if stored for more than one day.’

(*Page* 4, *clause* **6.2.1.1,** *para* 2 *and para* 3) — Delete.

(*Page* 4, *clause* **6.2.1.2**) — Delete.

(*Page* 4, *clause* **6.2.1.3**) — Substitute the following for the existing clause:

‘**6.2.1.3** *Tube sheet / End plate*

Tube sheet / end plate holes shall be effectively free from interior burrs or sharp edges. Tube sheet / end plate holes sizes shall be defined by the manufacturers in their drawing.’

(*Page* 4, *Table* 1) — Delete.

(*Page* 4, *clause* **6.2.1.4**) — Substitute the following for the existing clauses:

‘**6.2.1.4** *Expanded fin tightness*

Tube and fin should be expanded to get firm bonding between fin pack and tubes. With every change in tube specification the bullet size shall be checked to ensure proper bonding between tube and fin pack.’

(*Page* 4, *clause* **6.2.1.5**) — Substitute the following with the existing clause:

‘**6.2.1.5** *Brazing material selection*

Brazing material shall confirm to IS 2927 or International Standard.’

(*Page* 4 *clause* **6.2.1.6**) — Delete.

(*Page* 5, *Fig.* 5) — Delete.

(*Page* 5, *clause* **6.2.3**) — Delete.

(*Page* 5, *clause* **7.1.1**, *para* 3) — Substitute ‘0.000 1’ *for* ‘0.000 0.’

(*Page* 5, *clause* **7.1.2**) — Delete.

(*Page* 6, *clause* **7.2**) — Substitute the following for the existing clause:

‘**7.2 Leak Test**

Each coil shall undergo leak test to conform tightness specification. Leak test method is either water leak test, Helium leak test or vacuum test as described in **7.2.1, 7.2.2** and **7.2.3**.’

(*Page* 6, *clause* **7.2.1**) — Substitute the following for the existing clause:

‘**7.2.1** *Water Leak Test*

All coils shall be subjected to dry nitrogen or dry air with test pressure as design pressure for water leak test purpose.

The test shall be carried as described below:

a) Close one end with dead end plug and provide shut off valve on the other end of the test sample;
b) Connect the coupler to the other end and pressurize charge with dry nitrogen or dry air as specified; and
c) Submerge the coil assemble in water tank and hold for 1 min. Check for the bubble leakage. If no bubble is detected during the inspection, the coil is considered conform.

(*Page* 6, *Table* 2) — Delete.

(*Page* 6, *clause* **7.2.2**) — Substitute the following for the existing clause:

‘**7.2.2** *Helium Leak Test*

Helium is being used as tracer gas, sensitive to detect minute leaks in heat exchanger assemblies. Leak testing shall confirm to IS 9902.’

(*Page* 6, *clause* **7.2.2.1**) — Delete.

(*Page* 6, *clause* **7.2.2**) **—** Substitute the following for the existing clause:

‘**7.2.3** *Vacuum Leak Test Process*

The vacuum leak test shall be carried as follows:

a) All coils shall be subjected to nitrogen purging with test pressure of 500^{+50}_{-0} kPa before vacuum leak test for 10 s;

b) Vacuum coupler is to be connected with the test coil; and

c) Vacuum shall be done till the coil pressure reading is in between 0.2 and 0.25 Torr. The mentioned pressure should be achieved in 30^{+10}_{-0} s.’

[*Page* 6, *clause* **7.3.1** a) *and* b)] **—** Substitute the following for the existing:

‘Heat exchanger shall withstand 3 times the design pressure of the heat exchanger.’

(*Page* 6, *clause* **7.3.1,** *para* 2, *sentence* 2) — Substitute the following for the existing sentence:

‘The pressure is to be raised gradually until the highest pressure as above is reached.’

(*Page* 6, *clause* **7.3.2**, *last para*) — Substitute the following for the existing:

‘In addition to the above test, heat exchanger shall withstand the 2 times design pressure prior to cycle test and there should not be any visible leak or burst.’

(*Page* 8, *clause* **7.4.5.1**) — Delete.

[*Page* 8, *clause* **7.4.5.2** a)] — Substitute the following for the existing:

‘a) The corrosion resistance test to be carried out for to ensure the heat exchanger performs effectively under various atmospheric conditions. The test should be carried out for a minimum 72 h as per the procedure of IS 9844. After completion of test, heat exchanger shall confirm to assembly tightness specification as per **7.2**.’

[*Page* 8, *clause* **7.4.5.2** b)] — Delete.

[*Page* 8, *clause* **7.4.5.2** c)] — Delete.

(*Page* 8, *clause* **8.1**) — Substitute the following for the existing:

‘8.1 Marking of Finned Type Heat Exchanger

Each finned type heat exchanger for room air conditioners shall be marked with the following:

a) Name of manufacturer;

b) Country of manufacture;

c) Part number; and
d) Date of manufacture.'

(*Page* 8, *clause* **9.1**) — Substitute the following for the existing:

'9.1 Type Test

The type tests shall consist of the tests that would be necessary to check up the performance and characteristics of the units and components.

Type tests shall consist of the following:

a) Internal contamination as per **7.1.1**;
b) Test for mechanical strength as per **7.3**; and
c) Test for corrosion resistance as per **7.4**.'

(*Page* 8, *clause* **9.2**) — Substitute the following for the existing clause:

'9.2 Routine Tests

These shall consist of routine tests that would be conducted on each and every unit during manufacturing/ after completion at the manufacturer's works.

Routine tests shall consist of the following:

a) Visual Inspection as per **6.1**; and
b) Leak Test as per **7.2.**

NOTE — If a manufacturer produces both heat exchangers and air conditioners, then the leakage test either for heat exchanger or for air conditioner is applicable. In such case leakage test can be conducted as a part of room air conditioner routine test as per IS 1391 (Parts 1 and 2).'

(MED 03)

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